

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/JP2004/014705

International filing date (day/month/year)
29.09.2004

Priority date (day/month/year)
30.09.2003

International Patent Classification (IPC) or both national classification and IPC
G02F1/167

Applicant
CANON KABUSHIKI KAISHA

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITYInternational application No.
PCT/JP2004/014705

10/ 552 996

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2004/014705

Box No. II Priority

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. ☐ It has not been possible to consider the validity of the priority claim because a copy of the priority document was not available to the ISA at the time that the search was conducted (Rule 17.1). This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

4. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	3-9,11, 13-15
	No: Claims	1,2,10,12,16
Inventive step (IS)	Yes: Claims	3-7
	No: Claims	1,2,8-16
Industrial applicability (IA)	Yes: Claims	1-16
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

- 1 In the following communication a reasoned opinion is given with regard to clarity (section 3), novelty (section 4), and inventive activity (sections 5 and 6).
- 2 Reference is made to the following documents:

D1: US 2003/048521 A1 (IKEDA TSUTOMU ET AL) 13 March 2003 (2003-03-13)
D2: PATENT ABSTRACTS OF JAPAN vol. 1999, no. 09, 30 July 1999 (1999-07-30)
-& JP 11 109392 A (MATSUSHITA ELECTRIC IND CO LTD), 23 April 1999
(1999-04-23)
D3: PATENT ABSTRACTS OF JAPAN vol. 2003, no. 10, 8 October 2003 (2003-10-08) -& JP 2003 167107 A (HITACHI CHEM CO LTD), 13 June 2003 (2003-06-13)
- 3 There is a lack of clarity associated with claims 1 and 2 in contravention of Article 6 PCT.
 - 3.1 In the present wording of claim 1, the reflection properties of the diffuse reflector are defined purely in terms of the angular distribution of the intensity of the reflected light towards and away from regions where the (electrophoretic) particles are located when that reflector is exposed. The reflection properties are defined in terms of a result to be achieved and not in structural terms (see the Guidelines C-III, 4.7) rendering the claim unclear. Furthermore, the exact positions where the particles are located in the above mentioned case is undefined in the claim, further contributing to the lack of clarity.
 - 3.2 Claim 1, lines 19-21, and claim 2, lines 2-4: there is no finite verb in the clause introduced by *wherein* leading to a lack of clarity associated with this feature.
- 4 The present application does not meet the criteria of Article 33(1) PCT, because the

subject-matter of claims 1, 2, 10, 12 and 16 is not new in the sense of Article 33(2) PCT.

- 4.1 The document D1 is regarded as representing the closest prior art to the application since it has the largest number of features and effects in common with the application.
- 4.2 D1 discloses (the references in parentheses applying to this document):

A display apparatus (an electrophoretic display device, paragraph 32, figure 1), comprising:

a substrate on which a plurality of closed spaces are two-dimensionally disposed along a surface of said substrate (the pixels are divided into cells by cell walls, paragraph 44),

a plurality of particles contained in each of those closed spaces (paragraph 32), and a reflection surface provided on a first electrode (reference number 6) for reflecting light which enters each of the closed spaces (paragraph 68),

wherein said particles are moved in each closed space, between a first state at which they are diffused to cover said reflection surface and a second state at which they are collected near to a second electrode (reference number 7, paragraph 42) thus revealing said reflection surface, in order to change the intensity of reflected light so as to provide a bright display state and a dark display state (paragraphs 42-44, figures 5A, 5B),

and when said particles are in the second state, at least a part of the reflection surface diffusely reflects incident light (the first electrode is "roughened so as to irregularly reflect light" paragraph 68) with a directivity, wherein the intensity of the diffusely reflected light has an angular distribution such that:

first, an amount of reflected light toward the position at which said particles are collected is smaller than in the case where the reflection surface is an isotropically diffusive reflection surface, and

second, an amount of light reflected towards positions other than the position near to the second electrode at which said particles are collected is larger than that of light reflected towards said position.

D1 teaches that when the first electrode has a protrusion, the "light as reflected by the protruding portion is *emphasized* when the display surface is observed obliquely relative to the substrate" (paragraph 74). The expression *emphasized* implies first, that the diffuse reflection is not isotropic, i.e. the angular distribution of intensity is not

the same in all directions, but that the angular distribution of intensity has a maximum in an oblique direction from the substrate, i.e. it has directivity; and second, that the intensity distribution in other directions *must be less than in the isotropic case* as a consequence. Hence the above conditions are automatically satisfied by the display disclosed by D1 and the subject-matter of claim 1 is not novel.

- 4.3 Claim 2. The difference between the subject-matter of claim 2 and claim 1 is that the reference direction is no longer explicitly that of the particles in the second state but that of the partition wall. However, D1 clearly teaches that the particles are located at the second electrode in the second state and that this electrode is arranged either inside or underneath the partition wall. Hence D1 also takes away the novelty of claim 2.
- 4.4 Claim 10. D1 teaches the use of charged particles having a black colour (paragraph 48).
- 4.5 Claim 12. D1 teaches the use of a reflective first electrode (see above).
- 4.6 Claim 16. D1 teaches the use of insulating fluids (paragraph 69).
- 5 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 8, 9, 11 and 13-15 does not involve an inventive step in the sense of Article 33(3) PCT.
- 5.1 Claim 8: Displays having transparent substrates on which semitransparent reflectors have been arranged in order to accommodate a back light are well-known in the art.
- 5.2 Claim 9: Similarly, the use of scattering layers at the front side of a display is well-known in the art.
- 5.3 Claim 11: The colour of the partition wall being the same as that of the particles is also well-known in the art.
- 5.4 Claims 13-15: The arrangement of colour filters on reflective layers with transparent electrodes is well known in the art.

6 The combination of the features of dependent claims 3 to 7 is neither known from, nor rendered obvious by, the available prior art. The reasons are as follows:

6.1 Claim 3. The difference between the subject-matter of claim 3 and D1 lies in the following features:

- (1) the diffuse reflecting surface comprises portions having a different directivity,
- (2) the directivity of the portion close to the partition wall is stronger than that of the other portions.

6.1.1 The technical effects associated with this difference is that light incident on the reflector on the portion of the reflecting surface closer to the partition wall undergoes diffuse reflection stronger in directions away from the wall than towards it and that the strength of this reflection is greater than that experienced by light incident on other portions of the reflecting surface.

6.1.2 The technical problem can be formulated as how to achieve the technical effects identified above.

6.1.3 In the prior art, the use of a structured diffuse reflector is known. D2 provides an example from a liquid crystal display. Such reflectors may be used in electrophoretic displays also. However, the directivity of the diffuse reflector remains constant over the display and there is no hint of structuring the reflector in such a way as to have stronger directivities in some regions than in others. A combination of a diffuse reflector at the edge of a pixel and a mirror-like reflector in the central part of the pixel is known from D3, but in this case, the directivity of the central part of the display is much stronger than that of the part near the partition wall. Hence, there is no indication in the prior art, which would lead the person skilled in the art to the combination of features and technical effects of claim 3.

6.2 Claim 4. The subject-matter of the claim concerns a diffuse reflecting surface which comprises two or more portions in which the symmetry of the angular distribution of the reflected light is different in the portion closest to the partition wall compared to portions away from the partition wall. The subject-matter of the claim addresses a similar technical problem to that of claim 3 and presents a similar solution, i.e. that of portions having different diffuse-reflective properties. A similar argumentation to

that used for claim 3 also applies here.

6.3 Claim 5 depends on claim 4.

6.4 Claim 6. The use of a reflector consisting of a mirror-like and diffuse region is disclosed by D3, but the reflector in that document does not have the mirror-like region near the partition wall and diffusely reflecting portion away from the partition wall. Hence, the teaching provided by D3 would lead the person skilled in the art away from the features and effects of claim 6.

6.5 Claim 7 depends on claims 3 or 4.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

TOKO INTERNATIONAL PATENT OFFICE
Attn. Yamada, Ryuichi
Hasegawa Building 4F
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Minato-ku, Tokyo 105-0001
JAPAN



NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing (day/month/year) 23/12/2004	
Applicant's or agent's file reference 10002864WO01	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/JP2004/014705	International filing date (day/month/year) 29/09/2004
Applicant CANON KABUSHIKI KAISHA	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. Reminders

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until **30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the International Searching Authority



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Authorized officer

Jean-Michel De Caével

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.